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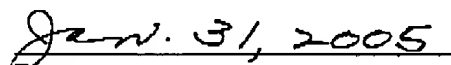
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Applicant:	Gregory A. Fish et al
Serial No.:	09/879,821
Filed:	June 11, 2001
Group Art Unit:	2815
For	MANUFACTURABLE SAMPLED GRATING MIRRORS
Our Ref. No.:	G&C 122.3-US-U1

By: Name: George H. Gates  
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Due Date: January 31, 2005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Gregory A. Fish et al.	Examiner:	Matthew C. Landau
Serial No.:	09/879,821	Group Art Unit:	2815
Filed:	June 11, 2001	Docket:	G&C 122.3-US-U1
Title:	MANUFACTURABLE SAMPLED GRATING MIRRORS		

CERTIFICATE OF MAILING OR TRANSMISSION UNDER 37 CFR 1.8

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By: GHG  
Name: George H. Gates

Mail Stop APPEAL BRIEF - PATENTS  
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P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

We are transmitting herewith the attached:

- ☒ Transmittal sheet, in duplicate, containing a Certificate of Mailing or Transmission under 37 CFR 1.8.
- ☒ Brief of Appellant(s).
- ☒ Charge the Fee for the Brief of Appellant(s) in the amount of \$250.00 to Deposit Account No. 50-0494.

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G&amp;C 122.3-US-U1

JAN 31 2005

Due Date: January 31, 2005

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**  
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:	)	
	)	
Inventor: Gregory A. Fish et al.	)	Examiner: Matthew C. Landau
	)	
Serial #: 09/879,821	)	Group Art Unit: 2815
	)	
Filed: June 11, 2001	)	Appeal No.: _____
	)	
Title: MANUFACTURABLE SAMPLED	)	
GRATING MIRRORS	)	

**BRIEF OF APPELLANTS**

Mail Stop APPEAL BRIEF - PATENTS  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In accordance with 37 CFR §41.37, Appellants' attorney hereby submits the Brief of Appellants on appeal from the final rejection in the above-identified application as set forth in the Office Action dated July 8, 2004.

Please charge the amount of \$250.00 to cover the required fee for filing this Brief as set forth under 37 CFR §41.20(b)(2) to Deposit Account No. 50-0494 of Gates & Cooper LLP. Also, please charge any additional fees or credit any overpayments to Deposit Account No. 50-0494.

**I. REAL PARTY IN INTEREST**

The real party in interest is Agility Communications, Inc., the assignee of the present application.

**II. RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences.

### III. STATUS OF CLAIMS

Claims 4-10, 13-16 and 20-29 have been canceled.

Claims 1-3, 11-12 and 17-19 are pending in the application.

Claims 1-3, 11-12 and 17-19 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellants regard as the invention.

Claims 1, 12 and 17 were rejected under 35 U.S.C. §102(b) as being anticipated by Little et al., U.S. Patent No. 5,668,900 (Little).

Claims 2, 3, 11, 18 and 19 were indicated as being allowable if rewritten to overcome the rejections under 35 U.S.C. §112, second paragraph, and to include the base claim and any intervening claims.

Claims 1-3, 11-12 and 17-19 are being appealed.

### IV. STATUS OF AMENDMENTS

An amendment under 37 C.F.R. §1.116 was submitted on October 27, 2004 in response to the final Office Action, wherein claim 2 was canceled, and claims 1, 12 and 17 were amended. An Advisory Action mailed November 9, 2004 indicated that the amendments would not be entered for the purposes of appeal. Record is made of a telephone interview between the below-signed Attorney and Examiner Landau that took place on November 4, 2004, wherein the below-signed Attorney inquired as to the status of the claim amendments submitted on October 27, 2004.

### V. SUMMARY OF THE INVENTION

Appellants' independent claim 1 is directed to an improved distributed Bragg reflector. The improved distributed Bragg reflector comprises a sampled grating, including a plurality of sampled grating portions having a first grating phase separated from each other by portions with no grating. The improved distributed Bragg reflector also comprises a first grating burst portion, at a beginning of a first one of the sampled grating portions, having a second grating phase, wherein the second grating phase is different from the first grating phase.

Appellants' independent claim 17 is also directed to a distributed Bragg reflector. The

distributed Bragg reflector comprises a sampled grating, including a plurality of sampled grating portions separated from each other by portions with no grating, wherein the sampled grating portions each have a first grating phase and a second grating phase.

With regard to the claims, Appellants' attorney requests that the Board refer to the specification generally. Specific portions of the specification that directly relate to the claims on appeal include:

(a) at page 7, line 10 through page 9, line 27, and in FIG. 2 as reference numbers 12 and 14, FIGS. 3a and 3b, FIG. 4 as reference numbers 400, 402A and 492B, and FIG. 6 as reference numbers 600, 602, 604A and 604B.

#### VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 1-3, 11-12 and 17-19 are indefinite under 35 U.S.C. §112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which Appellants regard as the invention.

2. Whether claims 1, 12 and 17 are anticipated under 35 U.S.C. §102(b) by Little et al., U.S. Patent No. 5,668,900 (Little).

#### VII. GROUPING OF CLAIMS

With regard to the first grounds for rejection, claims 1-3, 11-12 and 17-19 stand or fall together.

With regard to the second grounds for rejection, claims 1, 12 and 17 stand or fall together. Separate arguments for each of the grounds are provided below.

#### VIII. ARGUMENTS

##### A. Arguments Directed To The First Grounds for Rejection: Whether Claims 1-3, 11-12 and 17-19 Are Indefinite Under 35 U.S.C. §112, Second Paragraph

##### 1. The Office Action Rejections

On page (2) of the Office Action, claims 1-3, 11-12 and 17-19 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellants regard as the invention.

Specifically, the Office Action states the following:

In regards to claim 1, the limitation "sampled grating portions having a first grating phase" renders the claim indefinite. It is unclear what is meant by "phase" of a grating and how the phase of a grating is determined. The instant application refers to a "phase of the grating". However, Applicant does not explicitly define this terminology, or what it means in terms of structure. In other words, it is unclear exactly what structural features of the grating are defined by the "phase" of that grating. Does the period of the grating portion determine the phase? Is it number of teeth in a particular grating portion? Is it the height or width of the teeth? If Applicant contends that this terminology is well known in the art, appropriate references (in the form of patents, publications, or text books) should be provided that clearly define this limitation in terms of structure. Note claims 2, 17, and 1 have similar problems.

Further regarding claim 2, since it is unclear what determines grating phase, it is unclear what is meant by one phase being opposite to another phase. While it is acknowledged that Figure 6 of the instant application (lower right portion) shows a negative phase and a positive phase, Applicant does not disclose what structural characteristic a grating must have to obtain these phases. Note claim 19 has similar problems.

Appellants' attorney respectfully traverses these rejections.

2. Appellants' Claims 1-3, 11-12 and 17-19 Are Definite Under 35 U.S.C. §112, Second Paragraph

The definition of "phase" is well known in the art -- the relative location of the peaks and nulls (troughs). The phase of a wave relates the position of a feature, typically a peak or a trough of the waveform, to that same feature in another part of the waveform. It is also well-known that the concept of the phase of a structural grating is analogous to the phase of a wave (i.e., the phase of a grating is defined by the relative location of the teeth of the grating, while the phase of a waveform is related to the relative peak or trough of the wave).

Appellants' attorney submits that the specification as filed teaches the concepts of a grating having a phase, as well as a grating having a phase opposite of the phase of another grating.

For example, the Appellants' specification teaches the following.

In the case of the SG-DBR to be produced with a phase mask, the sampling function can only take the value of 0,1 or -1, with -1 indicating a phase reversal

of the grating function. (page 8, lines 1-2 of the application as filed - Emphasis added).

The phase mask technology for printing gratings, allows the sampling function to take on a value of +1, 0 and -1, with a manufacturable process that can be used to create sampled grating. Phase masking is well known to those skilled in the art, although this application is new. (page 8, lines 3-7 of the application as filed)

Another sampling function is shown in Figure 6. Reversing the phase of the grating at the beginning and end of each sample can be used to tailor the peak envelope to allow for higher kappa over a larger range. (page 8, lines 16-18 of the application as filed - Emphasis added).

Also, Appellants' attorney submits that the prior art teaches the concepts of a grating having a phase.

Appellants' attorney submitted Figure 6.5 and associated text from L.A. Coldren et al., "Diode Lasers and Photonic Integrated Circuits," John Wiley & Sons, 1995, p. 274, which shows the use of the term "grating phase." These are provided below:

Coldren: Figure 6.5

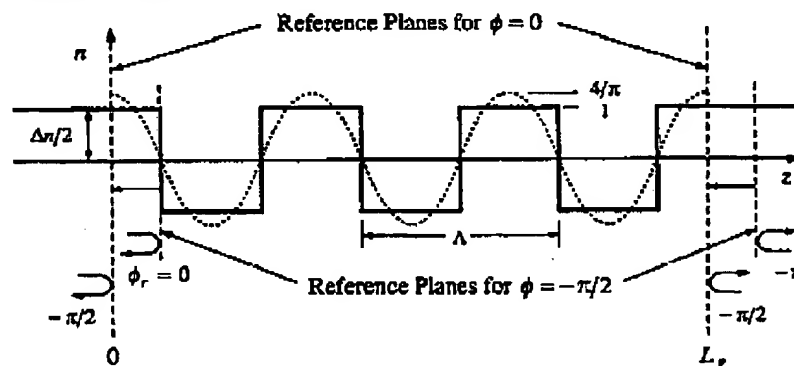


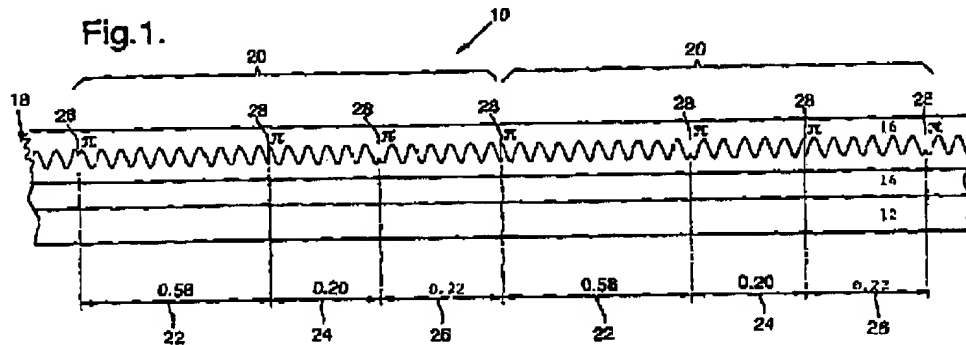
FIGURE 6.5 Illustration of reference planes used to define  $z = 0$  and  $z = L_g$  in a finite-length grating. The coupled-mode equations assume the index profile has a Fourier component that varies as  $\cos(2\beta_0 z - \phi)$ . The first set of reference planes are drawn for  $\phi = -\pi/2$  which aligns the  $z = 0$  plane with an index down step of a square wave grating (these are the reference planes assumed in Chapter 3). The second set shifts the planes to the left for a more symmetric placement by setting  $\phi = 0$ .

Coldren: Page 274, lines 14-16

These reflection phases are shown in Fig. 6.5 for two different choices of the grating phase,  $\phi$ , and a grating with  $L_g = m\Lambda$

In addition, U.S. Patent No. 6,345,135 to Reid, which was cited by the Office, also defines the "phase" of the "grating." For example, Reid shows a change in the phase of the grating at boundaries 28 in FIG. 1:

Reid: FIG. 1



See also the following portions of Reid:

Reid: Abstract

A multi-wavelength optical reflector comprises a diffraction grating structure (18) which comprises a plurality of repeat grating units (20) in which each grating unit (20) comprises a series of adjacent diffraction gratings (22, 24, 26) having the same pitch. The grating units (20) and adjacent gratings within a grating unit are separated by a phase change (28) of substantially pi ( $\pi$  radians). The lengths of the gratings (22, 24, 26), which are different for each grating within a grating unit, are selected so as to provide a predetermined comb reflection spectrum which comprises a plurality of reflection maxima of substantially equal reflectivity. (Emphasis added.)

Reid: col. 4, lines 15-22

Unlike the known reflective waveguides, the grating structure 18 of the present invention comprises a number of repeat units 20 each of which comprises three Bragg gratings of identical constant pitch which are of different lengths 22, 24, 26, respectively. Adjacent repeat units 10 and adjacent gratings within a unit 20 are defined by phase shifts of  $\pi$  radians (that is 180 degrees) in the periodic



amplitude variation of the grating structure 18. These phase shifts are denoted by the boundaries 28 in FIG. 1. (Emphasis added.)

Reid: col. 8, lines 46-54

1. A multi-wavelength optical reflector comprising: a diffraction grating structure comprising a plurality of repeat grating units in which each grating unit comprises a series of adjacent diffraction gratings having the same pitch; wherein grating units and adjacent gratings within a grating unit are separated by a phase change of substantially pi ( $\pi$ ) radians and wherein at least two of the gratings within a grating unit have different lengths; the lengths being selected so as to provide a predetermined reflection spectrum. (Emphasis added.)

Note, however, that while Reid changes the phase of the gratings, the grating portions are adjacent and are not separated by portions with no grating.

Based on the above, Appellants' attorney respectfully submits that the claims are definite under 35 U.S.C. §112, second paragraph.

B. Arguments Directed To The Second Grounds for Rejection: Whether Claims 1, 12 And 17 Are Anticipated Under 35 U.S.C. §102(b) By Little

1. The Office Action Rejections

On page (3) of the Office Action, claims 1, 12, and 17 were rejected under 35 U.S.C. §102(b) as being anticipated by Little et al., U.S. Patent No. 5,668,900 (Little). However, on page (4) of the Office Action, claims 2, 3, 11, 18, and 19 were indicated as being allowable if rewritten to overcome the rejections under 35 U.S.C. §112, second paragraph, and to include the base claim and any intervening claims.

Appellants' attorney acknowledges the indication of allowable claims, but respectfully traverse these rejections.

2. The Appellants' Independent Claims

Independent claim 1 is directed to an improved distributed Bragg reflector comprising:  
a sampled grating, including a plurality of sampled grating portions having a first grating phase separated from each other by portions with no grating; and  
a first grating burst portion, at a beginning of a first one of the sampled grating portions, having a second grating phase, wherein the second grating phase is different from the first grating phase.

Independent claim 17 is directed to a distributed Bragg reflector comprising:  
a sampled grating, including a plurality of sampled grating portions separated from each other  
by portions with no grating;  
wherein the sampled grating portions each have a first grating phase and a second grating phase.

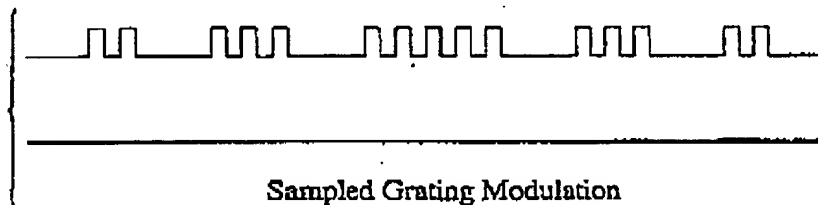
3. The Little Reference

Little describes improvements in distributed feedback optical reflection filters. In particular, taper shapes for the optical reflection couplers are determined by a design method based on a variational optimization theory, to provide an out-of-band sidelobe suppression ratio of greater than -30 dB, and a reduced width of the filtered bandwidth for a specified side lobe suppression level.

4. Appellants' Claims 1, 12 and 17 Are Patentable Over The References

Appellants' invention, as recited in claims 1, 12 and 17, is patentable over the references, because the claims recite limitations not found in the references. Nonetheless, the Office Action states that FIG. 12(d) of Little shows all the elements of Appellants' claims, which is shown below:

**FIG. 12(d)**



See also the following portions of Little:

Little: col. 12, lines 38-43

(v) adjusting the average coupling strength through sampled grating modulation.

As shown in FIG. 12d, the average coupling strength over a certain length range may be varied by turning some gratings off, i.e. removing grating teeth to modulate the effective coupling strength.

Specifically, with regard to independent claim 1, FIG. 12(d) of Little does not teach or suggest a first grating burst portion, at a beginning of a first one of the sampled grating portions, having a second grating phase, wherein the second grating phase is different from the first grating phase of a plurality of sampled grating portions. Similarly, with regard to independent claim 17, FIG. 12(d) of Little does not teach or suggest a sampled grating, including a plurality of sampled grating portions separated from each other by portions with no grating, wherein one or more of the sampled grating portions have a first grating phase and remaining ones of the sampled grating portions have a second grating phase.

Instead, FIG. 12(d) of Little merely describes a sampled grating that includes a plurality of sampled grating portions or grating bursts separated from each other by portions with no grating. However, removing gratings is not the same as changing the phase of the gratings. The sampled grating of FIG. 12(d) would have been produced by a sampling function  $f(x)$  using only the values of 1 (grating) or 0 (no grating), but not -1, which indicates a sampled grating portion having a phase opposite (i.e., different) that of another sampled grating portion having a value of 1. Consequently, FIG. 12(d) of Little does not teach or suggest Appellants' claimed invention.

Moreover, the various elements of Appellants' claimed invention together provide operational advantages over Little. In addition, Appellants' invention solves problems not recognized by Little.

Thus, Appellants' attorney submits that independent claims 1 and 17 are allowable over Little. Further, dependent claim 12 is submitted to be allowable over Little in the same manner, because it is dependent on independent claim 1, and thus contains all the limitations of independent claim 1.

## IX. CONCLUSION

In light of the above arguments, Appellants' attorney respectfully submits that the claims are definite and the cited references do not anticipate nor render obvious the claimed invention. More specifically, Appellants' claims recite novel physical features which patentably distinguish over any and all references under 35 U.S.C. §§ 102 and 103.

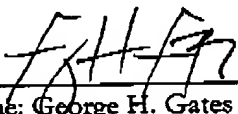
In view of the above, a decision by the Board of Patent Appeals and Interferences reversing the Examiner and directing allowance of the pending claims in the subject application is respectfully solicited.

Respectfully submitted,

GATES & COOPER LLP  
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